Reg. No. :

Question Paper Code: 44402

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2018

Fourth Semester

Electronics and Communication Engineering

14UEC402 - ANALOG CIRCUITS

(Regulation 2014)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. Sinusoidal oscillators operate with _____ feedback

    (a) Positive   (b) Negative

    (c) Both a and b   (d) None of the above

2. _____ is the oscillator that has highest frequency stability.

    (a) Hartley   (b) Colpitts   (c) Clapp   (d) Crystal

3. Free running oscillator is also called as_____ multivibrator.

    (a) Astable   (b) Bistable   (c) monostable   (d) blocking

4. _____ Circuit is used to restore dc value to the input signal.

    (a) clamper   (b) clipper   (c) recitifier   (d) integrator

5. The open loop gain of an ideal Op amp is

    (a) infinite   (b) finite   (c) zero   (d) unity

6. _____means growing single crystal silicon structure upon a original silicon substrate.

    (a) Etching   (b) Epitaxy   (c) Ion implantation (d) Diffusion

7. _____ is a nonlinear application of operational amplifier.

      (a) Adder   (b) Subtractor   (c) Differentiator   (d) Comparator

8. Precision rectifier are used to rectify voltages in range of _____volts.

      (a) milli   (b) kilo   (c) mega   (d) giga

9. Which of the following circuits use operational amplifiers as an active device?

      (a) Oscillator circuit   (b) Phase Locked Loop
      (c) Active filter circuits   (d) All the above

10. A flash type ADC requires _____ comparators for an n-bit conversion.

      (a) $1-2^n$ (b) 2^n+1 (c) $2^n -1$ (d) 2^n

PART - B (5 x 2 = 10 Marks)

11. Sate Barkhausen criterion for sustained oscillation.

12. Draw a clipper circuit which clips all voltages above +2V.

13. List out the steps used in the preparation of Si – wafers.

14. Define capture range of a PLL.

15. Draw the block diagram of Successive Approximation type ADC.

PART - C (5 x 16 = 80 Marks)

16. (a) Explain the operation of RC phase shift oscillator with a neat circuit diagram and derive the expression of frequency of oscillation and the condition for sustained oscillation.   (16)

Or

  (b) (i) Explain Armstrong oscillator and derive its frequency of oscillation   (8)

     (ii) A Colpitts oscillator is designed with $C1 = 100pF$ and $C2 = 7500pF$. The inductance is variable. Determine the range of inductance values if the frequency of oscillation is to vary between 950 kHz and 2050 kHz.   (8)

17. (a) (i) Describe the response of low pass RC circuit for step and square wave input. Sketch the circuits and waveforms.   (8)

     (ii) Explain with suitable circuit and waveforms, the operation of positive and negative clampers.   (8)

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Or

(b) Explain the operation of collector coupled Astable multivibrator with neat circuit diagram and waveforms. Derive the expression of the time period. (16)

18. (a) (i) Discuss the various ways to fabricate diodes. (8)

(ii) Explain how a monolithic capacitor can be fabricated? (8)

Or

(b) What is the need for frequency compensation in practical op-amps? Explain the frequency compensation techniques in detail. (16)

19. (a) Explain the working of PLL with neat block diagram and derive the expression for lock in range and capture range. (16)

Or

(b) With a neat sketch, explain the working of (i) Schmitt trigger (ii) Precision Rectifier. (16)

20. (a) Draw and explain the functional block diagram of a 723 regulator. (16)

Or

(b) Draw and explain the functional block diagram of three terminal fixed and adjustable voltage regulator. (16)

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